

ABSTRACT

A method to form a semiconductor taper without etching the taper surfaces.

In one embodiment, a semiconductor waveguide is formed on a workpiece having an unetched top surface; e.g., using a silicon on insulator (SOI) wafer. A protective layer is formed on the waveguide. The protective layer is patterned and etched to form a mask that exposes a portion of the waveguide in the shape of the taper's footprint. In one embodiment, selective silicon epitaxy is used to grow the taper on the exposed portion of the waveguide so that the taper is formed without etched surfaces. Micro-loading effects can cause the upper surface of the taper to slope toward the termination end of the taper.

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